



REPORT ON GEOTECHNICAL INVESTIGATION

PALMER PARK RESTROOM FACILITY

200 NORTH RIVERSIDE AVENUE
ST. CLAIR, MICHIGAN 48079

LATITUDE 42.82517° N
LONGITUDE 82.48517° W



CONSULTING
GROUP

Prepared for:

Anderson, Eckstein & Westrick, Inc.
51301 Schoenherr Road
Shelby Township, Michigan 48315

G2 Project No. 260214
March 24, 2026

March 24, 2026

Mr. Joseph Lech, P.E.
Project Manager
Anderson, Eckstein & Westrick, Inc.
51301 Schoenherr Road
Shelby Township, Michigan 48315

RE: Report on Geotechnical Investigation
Palmer Park Restroom Facility
200 North Riverside Avenue
St. Clair, Michigan 48079
G2 Project No. 260214

Dear Mr. Lech:

We have completed the geotechnical investigation for the proposed new restroom facility located in St. Clair, Michigan. This report presents the results of our observations and analyses, recommendations for subgrade preparation, foundation, and construction considerations as they relate to the geotechnical conditions at the site.

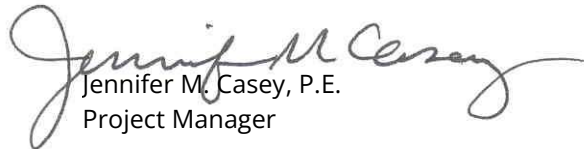
We appreciate the opportunity to be of service to Anderson, Eckstein & Westrick, Inc. (AEW), and look forward to discussing the recommendations presented. In the meantime, if you have any questions regarding the report or any other matter pertaining to the project, please call us.

Sincerely,

G2 Consulting Group, LLC



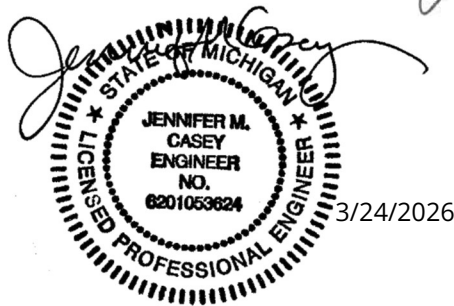
Matthew L. Henningsen, E.I.T.
Managing Principal



Jennifer M. Casey, P.E.
Project Manager

MLH/JMC/ljv

Enclosures



EXECUTIVE SUMMARY

We understand the project includes the construction of an approximately 22-foot by 7-foot restroom building with an approximate height of 12 feet located at Palmer Park in St. Clair, Michigan. Additionally, a proposed 2-inch water service line will be installed in an open-cut excavation extending from the south side of the restroom to the 8-inch water main located on the east side of North Riverside Avenue, and a proposed 3-inch sanitary sewer service will be installed using jack and bore techniques from the north side of the restroom north approximately 355 feet to the existing 3-inch sanitary stub. Both utilities are proposed to be at an approximate depth of 5 feet below existing grade.

Approximately 12 to 14 inches of sandy clay topsoil is present at all of the soil boring locations. Stiff to hard silty clay fill underlies the topsoil and extends to approximate depths of 3 and 5-1/2 feet. Soft to medium silty clay fill underlies the upper silty clay fill and extends to approximate depths of 5-1/2 and 8 feet. Loose silty sand fill is present below the silty clay fill within boring B-2 and extends to an approximate depth of 8-1/2 feet. Very loose native silty sand is present below the silty sand fill and extends to an approximate depth of 10 feet. Very soft to medium native silty clay is present below the fill and native silty sand within both borings and extends to the explored depth of 20 feet. During drilling operations, groundwater was measured at depths of 8 and 5-1/2 feet. Upon completion of drilling, wet caves were measured at 9 feet and 7 feet.

Provided additional risk of settlement can be tolerated, the proposed restroom can be supported on conventional shallow strip and/or spread footings bearing on the medium very stiff silty clay fill using a low bearing capacity. A net allowable soil bearing pressure of 500 psf may be used for design of foundations bearing on the existing silty clay fill. Due to the increased risk of settlement, we recommend the foundations be structurally tied to the floor slab and the foundations and slab be poured monolithically.

If the risk of increased settlement cannot be tolerated, the existing silty clay fill soils must be completely removed to an approximate depth of 5-1/2 and 8 feet within the entire proposed building footprint and zone of influence of the proposed foundations and the resulting excavation must be backfilled with engineered fill. A net allowable soil bearing capacity of 2,000 psf may be used for design of building foundations bearing on the engineered fill at a depth no greater than 3-1/2 feet below existing grade.

If the existing fill is completely removed and replaced with engineered fill within the proposed building footprint for support of shallow foundations, floor slabs can be supported on the engineered fill. A subgrade modulus (k) of up to 125 pounds per cubic inch (pci) may be used in the design of floor slabs supported on the engineered fill. If the existing fill is not completely removed and replaced with engineered fill, a subgrade modulus of up to 90 pci may be used in the design of floor slabs supported on the aforementioned soils.

Medium to very stiff silty clay is expected at a depth of 5 feet; however, silty sand fill is present at an approximate depth of 5-1/2 feet within soil boring B-2. If jack and bore operations extend into the granular soil, we anticipate this soil will run during boring construction operations and result in instability of the excavation and possible subsidence of the existing parking lot and proposed restroom. Therefore, we recommend boring and jacking operations be performed above a depth of 5-1/2 feet within the medium to very stiff silty clay present between approximate depths of 3 feet to 5-1/2 feet below existing grades. If water main installation is required deeper than 5-1/2 feet below the pavement, we recommend that sanitary installation be performed by directional drilling methods.

This summary is not to be considered separate from the entire text of this report, with all the conclusions and qualifications mentioned herein. Details of our analysis and recommendations are discussed in the following sections and in the Appendix of this report.

PROJECT DESCRIPTION

We understand the project includes the construction of an approximately 22-foot by 7-foot restroom building with an approximate height of 12 feet located at Palmer Park in St. Clair, Michigan. The building is to be pre-fabricated using concrete masonry units (CMUs) and a steel-framed roof. Additionally, a 3-inch sanitary sewer service and a 2-inch water service will be installed. The sanitary sewer will be constructed by horizontal directional drilling, and the water service by open-cut excavations. The sanitary line will connect to an existing sanitary sewer stub located to the north of the proposed restroom.

Existing and finished grades were not available at the time of this report. We assume finished grades will be similar to existing grades. If finished grades differ from our assumptions for the proposed walking path reconstruction, G2 should be notified so we can review the recommendations provided herein.

Structural loading conditions were not available at the time of the investigation; however, we anticipate the building will be lightly loaded with wall loads ranging from 1 to 2 kips per linear foot. If the final loading conditions vary from those assumed in this report, G2 Consulting Group, LLC (G2) must be notified so we can reevaluate our recommendations.

SCOPE OF SERVICES

The field operations, laboratory testing, and engineering report preparation were performed under the direction and supervision of a licensed professional engineer. Our services were performed according to generally accepted standards and procedures in the practice of geotechnical engineering in this area. Our scope of services for this project is as follows:

1. We drilled two (2) soil borings within the footprint of the proposed restroom extending to 20 feet below grade each.
2. We performed laboratory testing on representative samples obtained from the soil borings. Laboratory testing included visual engineering classification, moisture content, organic matter content (loss-on-ignition), and unconfined compressive strength determination.
3. We prepared this engineering report. The report includes recommendations regarding foundation types suitable for the soil conditions encountered, allowable bearing capacities of the anticipated bearing soil layers, estimated settlement, and construction considerations related to site preparation and foundation design.

FIELD OPERATIONS

Anderson, Eckstein, and Westrick (AEW), in conjunction with G2, selected the number, depth, and location of the soil borings. The soil boring locations were determined in the field by a G2 engineer by use of GPS assisted mobile technology and measuring from known surface features using conventional taping methods prior to the commencement of drilling operations. The approximate soil boring locations are shown on the Soil Boring Location Plan, Plate No. 1. Ground surface elevations at the soil boring locations were not available at the time of this report.

The soil borings were drilled using a truck-mounted rotary drilling rig. Continuous flight, 2-1/4-inch, inside diameter, hollow-stem augers were used to advance borings to the explored depths. Soil samples were generally obtained at intervals of 2-1/2 feet within the upper 10 feet and at 5-foot intervals thereafter. These samples were obtained by the Standard Penetration Test method (ASTM D 1586), which involves driving a 2-inch diameter split-spoon sampler into the soil with a 140-pound weight falling 30 inches. The sampler is generally driven three

successive 6-inch increments with the number of blows for each increment recorded. The number of blows required to advance the sampler the last 12 inches is termed the Standard Penetration Resistance (N). Blow counts for each 6-inch increment and the resulting N-values are presented on the individual soil boring logs.

The soil samples were placed in sealed containers in the field and brought to our laboratory for testing and classification. During the field operations, the driller maintained logs of the encountered subsurface conditions, including changes in stratigraphy and observed groundwater levels. The final boring logs are based on the field logs supplemented by laboratory soil classification. After completion of drilling operations, the boreholes were backfilled with excavated material.

LABORATORY TESTING

Representative soil samples were subjected to laboratory testing to determine soil parameters pertinent to foundation design and site preparation. An experienced geotechnical engineer classified the samples in general conformance with the Unified Soil Classification System.

Laboratory testing included moisture content, organic matter content, and unconfined compressive strength determinations. The organic matter content of representative samples was determined in accordance with ASTM Test Method D 2974, "Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils." The unconfined compressive strengths were determined using a spring-loaded hand penetrometer and a Torvane shear device. The hand penetrometer estimates the unconfined compressive strength to a maximum of 4-1/2 tons per square foot (tsf) by measuring the resistance of the soil sample to the penetration of a calibrated spring-loaded cylinder. The Torvane shear device estimates the shear strength to a maximum of one tsf by measuring the resistance of the soil sample to the applied torque of a vane seated in the soil sample. The shear strength determined by the Torvane is multiplied by two and presented on the soil boring log as an equivalent unconfined compressive strength.

The results of the moisture content, organic matter content, and unconfined compressive strength laboratory tests are indicated on the soil boring logs at the depths at which the samples were obtained. We will hold the soil samples for 60 days from the date of this report. If you would like the samples, please let us know prior to this date.

SITE DESCRIPTION

The site is located within Palmer Park, at 200 North Riverside Avenue in St. Clair, Michigan. The restrooms are to be located approximately 35 feet west of the St. Clair River and 65 feet east of North Riverside Avenue. Historical aerial images show that this park was a recreational beachfront in 1951, with occasional residential houses.



Figure 1: Historical Aerial Photograph from 1951

Between 1951 and 1986, the site grades appear to have been raised with a plaza, seawall, and boardwalk being constructed along the St. Clair River and the residential homes being demolished.

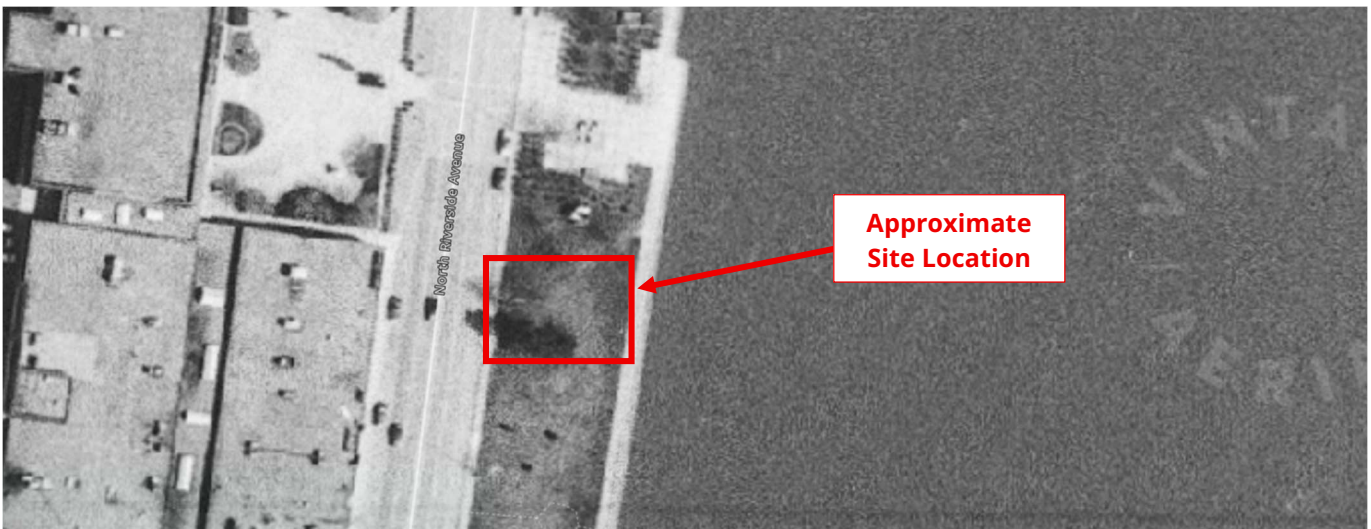


Figure 2: Historical Aerial Photograph from 1986

Between 1986 to 1999, the plaza was removed. The proposed site location currently is used as a temporary restroom location with concrete slabs and portable restrooms on top of the slabs which will remain.



Figure 3: Aerial Photograph from 2022

SOIL CONDITIONS

Approximately 12 to 14 inches of sandy clay topsoil is present at all of the soil boring locations. Silty clay fill underlies the topsoil and extends to approximate depths of 8 and 5-1/2 feet within borings B-1 and B-2, respectively. Silty sand fill is present below the silty clay fill within boring B-2 and extends to an approximate depth of 8-1/2 feet. Native silty sand is present below the silty sand fill and extends to an approximate depth of 10 feet. Native silty clay is present below the silty clay fill in boring B-1 and the native silty sand in boring B-2 and extends to the explored depth of 20 feet.

The cohesive fill soils are highly variable in consistency. The upper 5-1/2 feet of silty clay fill within boring B-1 are stiff to very stiff in consistency with natural moisture contents of 19 and 24 percent, an organic matter content of 2 percent within sample S-1, and unconfined compressive strengths of 2,000 and 5,000 psf. Within boring B-2, the upper 3 feet of silty clay fill is hard in consistency with a natural moisture content of 17 percent and an unconfined compressive strength of 8,000 psf. The underlying silty clay fill within boring B-1 is very soft in consistency with a natural moisture content of 26 percent, an organic matter content of 4 percent, and an unconfined compressive strength of 200 psf. The lower silty clay fill within boring B-2 is medium in consistency with a natural moisture content of 26 percent, an organic matter content of 3 percent, and an unconfined compressive strength of 1,000 psf. The silty sand fill is loose in compactness with a Standard Penetration Test (SPT) N-value of 7 blows per foot and an organic matter content of 4 percent. The native silty sand is very loose in compactness with an SPT N-value of 3 blows per foot. The native silty clay within boring B-1 to an approximate depth of 10-1/2 feet is medium in consistency with a natural moisture content of 27 percent and an unconfined compressive strength of 1,000 psf. Elsewhere, the native silty clay is very soft in consistency with natural moisture contents ranging from 27 to 38 percent and unconfined compressive strengths ranging from 100 to 250 psf.

GROUNDWATER CONDITIONS

Groundwater observations were made during and upon completion of drilling operations. During drilling, groundwater was measured at depths of 8 and 5-1/2 feet within soil borings B-1 and B-2, respectively. Upon completion of drilling, wet caves were measured at 9 feet and 7 feet within soil borings B-1 and B-2, respectively. Fluctuations in perched and long-term groundwater levels should be anticipated due to seasonal variations and following periods of prolonged precipitation. It should also be noted that groundwater observations made during drilling operations in cohesive soils are not necessarily indicative of the static groundwater level. This is due to the low permeability of such soils and the tendency of drilling operations to seal off the natural paths of groundwater flow. In general, we anticipate the static groundwater level will coincide with the water level in the adjacent St. Clair River.

SITE PREPARATION

If a higher risk settlement of the restroom can be tolerated, we anticipate a moderate amount of earthwork will be required to prepare the site for construction of the proposed restroom. Earthwork operations are expected to consist of demolition of the existing concrete slabs in front of the proposed restroom, removal of the surficial topsoil and vegetation, constructing new sanitary and water services, preparing the subgrade for concrete pavements, and excavating for foundations. Any existing utilities and associated backfill in the zone of influence of the proposed restroom should be completely removed and the resulting excavations backfilled with engineered fill. We recommend all earthwork operations be performed in accordance with comprehensive specifications and properly monitored in the field by qualified geotechnical engineers or technicians.

If an increased risk of settlement of the structure cannot be tolerated, we recommend the existing cohesive fill soils be removed and replaced with engineered fill beneath the proposed structure and a minimum of 5 feet beyond the edge of structure foundations.

At the start of earthwork operations, any existing topsoil and vegetation should be removed in their entirety from the footprint of the proposed restroom and concrete sidewalk. The exposed subgrade should be proof rolled with a fully loaded dump truck and visually evaluated for instability and/or unsuitable soil conditions. Any unstable or unsuitable areas noted should be improved by compaction or removed and replaced with engineered fill.

Engineered fill should be free of organic matter, frozen soil, clods, or other harmful material. The fill should be placed in uniform horizontal layers that are not more than 9 inches in loose thickness. The engineered fill should be compacted to achieve a density of at least 95 percent of the maximum dry density as determined by the Modified Proctor compaction test (ASTM D 1557). All engineered fill material should be placed and compacted at approximately the optimum moisture content. Frozen material should not be used as fill, nor should fill be placed on a frozen subgrade.

FOUNDATION RECOMMENDATIONS

The existing fill soils encountered at the soil boring locations for the proposed restroom do not appear to have been placed in an engineered manner, contain organic matter, and are highly variable. Foundations bearing on the existing fill soils will have a higher risk of settlement. If increased settlement cannot be tolerated, we recommend completely removing the existing silty clay fill soils, backfilling the resulting excavations with engineered fill, and supporting the building on conventional shallow strip and spread footings bearing on the engineered fill overlying fill soils.

Shallow Foundations Bearing on Existing Fill

Provided additional risk of settlement can be tolerated, the proposed restroom can be supported on conventional shallow strip and/or spread footings and bearing on the medium very stiff silty clay fill using a low bearing capacity. A net allowable soil bearing pressure of 500 psf may be used for design of foundations bearing on the existing silty clay fill. Due to the increased risk of settlement, we recommend the foundations be structurally tied to the floor slab and the foundations and floor slab be poured monolithically.

Exterior footings must bear at a minimum depth of 3-1/2 feet below finished grade for protection against frost heave. Interior foundations can bear at shallower depths provided suitable bearing soils are present, and the foundations are continuously protected from frost penetration during construction.

The total and differential settlements for the completed structure may be upwards of 2 inches and 1 inch, respectively, due to the presence of the existing fill. We recommend the structure be evaluated to determine if increase settlement can be tolerated. We recommend all foundations be suitably reinforced to minimize the effects of differential settlements associated with local variations in subsoil conditions.

Shallow Foundations Bearing on Engineered Fill

If the risk of increased settlement cannot be tolerated, the existing silty clay fill soils must be completely removed to an approximate depth of 5-1/2 and 8 feet within the entire proposed building footprint and zone of influence of the proposed foundations. The zone of influence can be described as the area beneath the proposed foundation projected outward from the edge of the foundation at a slope of 1 horizontal unit to 3/4 vertical unit extending to the bottom of the existing fill layer.

Following removal of the existing fill soils, the resulting excavations must be backfilled with engineered fill as described in the Site Preparation recommendations section of this report. A net allowable soil bearing capacity of 2,000 psf may be used for design of building foundations bearing on the engineered fill at a depth no greater than 3-1/2 feet below existing grade.

General

We recommend a G2 engineer or technician be on site during pre-construction evaluation to observe the foundation excavations and verify the adequacy of the bearing soils. Continuous wall or strip footings should be at least 18 inches in width, and isolated spread footings should be at least 30 inches in their least dimension. Adjacent spread footings at different levels should be designed and constructed so that the least lateral distance between them is equivalent to or more than the difference in their bearing levels. To achieve a change in the level of a strip foundation, the foundation should be gradually stepped at a grade no steeper than two units horizontal to one unit vertical.

FLOOR SLABS

If the existing fill is completely removed and replaced with engineered fill within the proposed building footprint for support of shallow foundations, floor slabs can be supported on the engineered fill. A subgrade modulus (k) of up to 125 pounds per cubic inch (pci) may be used in the design of floor slabs supported on the engineered fill.

If the existing fill is not completely removed and replaced with engineered fill and provided the potential for settlement associated with the existing fill can be tolerated, the existing fill can remain in place for support of the floor slabs following completion of earthwork operations in the SITE PREPARATION section of this report. A subgrade modulus of up to 90 pci may be used in the design of floor slabs supported on the aforementioned soils.

We recommend at least 4 inches of clean coarse sand or gravel be placed between the subgrade and the bottom of the floor slab for use as a capillary break. If greater protection against vapor transmission is desired, a vapor barrier consisting of 10-mil plastic sheeting, or equivalent, may be placed on top of the granular subbase directly below the floor slab.

UTILITY CONSTRUCTION RECOMMENDATIONS

The proposed 2-inch water service line will be an open-cut excavation extending from the south side of the restroom to the 8-inch water main located on the east side of North Riverside Avenue. The proposed 3-inch sanitary sewer service will be jack and bored from the north side of the restroom north approximately 355 feet north to the 3-inch sanitary stub. Both utilities are proposed to be at an approximate depth of 5 feet below existing grade.

Open-Cut Excavations

Groundwater was observed within the soil borings at depths ranging from 5-1/2 to 8 feet. Temporary unsurcharged trench excavations for the proposed open-cut water service installation operations that extend below a depth of 5 feet must be sloped back at a minimum of 1 horizontal to 1 vertical (1H:1V) within the existing cohesive fill soils. Where seepage from excavation cuts is observed, the slopes must be flattened sufficiently to achieve stability, but in no case left steeper than 3H:1V at and below the seepage level. If the temporary construction embankments are to be maintained during the rainy season, berms are suggested along the tops of the embankments to prevent runoff water from entering the excavation and eroding the slope faces. The soils exposed in slope faces should be inspected by qualified personnel so modifications of the slopes can be made if variations in the soil or water conditions occur. If sufficient space for open-cut consideration is not available, trench box shoring may be used.

Trench box shoring may be used provided some lateral deflection of adjacent soils can be tolerated. If a trench box is used, excavations should be performed from within the trench box, such that no unsupported vertical cut is allowed to exist. A trench box is not recommended where adjacent utilities, roadways, or structures are located less than a lateral distance delineated by a plane extending upward from the bottom edges of the excavation at a 1H:1V slope.

All excavations should be safely sheeted, shored, sloped, or braced in accordance with MI-OSHA requirements. If material is stored or equipment is operated near the excavation, stronger shoring must be used to resist the extra pressure due to the superimposed loads. Care should always be exercised when excavating near existing buildings, roadways, or utilities to avoid undermining. In no case should excavations extend below the level of adjacent structures or utilities unless underpinning is planned.

Jack and Bore Installation

It is our understanding that the 3-inch sanitary sewer will cross beneath the parking lot and the grass area and is proposed to be installed using jack and bore methods. Soil conditions consist primarily of cohesive soils which are underlain by granular soils to a depth of approximately 10 feet within boring B-2. Groundwater was encountered at an approximate depth of 5-1/2 to 8 feet during drilling operations.

Medium to very stiff silty clay is expected at a depth of 5 feet; however, silty sand fill is present at an approximate depth of 5-1/2 feet within soil boring B-2. If jack and bore operations extend into the granular soil, we anticipate this soil will run during boring construction operations and result in instability of the excavation and possible subsidence of the existing parking lot and proposed restroom. Therefore, we recommend boring and jacking operations be performed above a depth of 5-1/2 feet within the medium to very stiff silty clay present between

approximate depths of 3 feet to 5-1/2 feet below existing grades. If water main installation is required deeper than 5-1/2 feet below the pavement, we recommend that sanitary installation be performed by directional drilling methods.

CONSTRUCTION CONSIDERATIONS

Shallow Foundations

The existing fill may be able to withstand short-term, vertical cuts. However, we anticipate some caving and/or sloughing may occur, particularly if excavations are left open for an extended period of time. The contractor should come prepared to over excavate and form shallow foundations within the existing fill soils, if necessary. The sides of the spread and/or strip footing foundations must be constructed straight and vertical to reduce the risk of frozen soil adhering to the concrete and raising the foundations. All excavations should be backfilled with engineered fill when supporting overlying foundations and floor slabs.

If the existing cohesive soils are removed and replaced with engineered fill, excavations will extend deeper than 5 feet. Therefore, we recommend maximum slopes of 2H:1V for sloped excavations within any granular fill soils and 1H:1V in the cohesive fill soils. Where seepage from excavation cuts is observed, the slopes must be flattened sufficiently to achieve stability, but in no case left steeper than 3H:1V at and below the seepage level. Excavations should not extend below the groundwater table without dewatering. All excavations should be safely sheeted, shored, sloped, or braced in accordance with MI-OSHA requirements. If material is stored or equipment is operated near an excavation, stronger shoring must be used to resist the extra pressure due to the superimposed loads.

Groundwater Control

Groundwater was observed within both of the soil borings at depths ranging from 5-1/2 to 8 feet. If the cohesive fill is removed and replaced with engineered fill, temporary construction dewatering will be required to maintain dry conditions. We anticipate groundwater can be lowered by 1 to 2 feet using a series of properly constructed sumps and/or pumps. Where the excavation is underlain by cohesive soils; we recommend closely spaced sumps and/or pumps set in the silty clay be used to remove excess water within the excavation.

GENERAL COMMENTS

We have formulated the evaluations and recommendations presented in this report relative to site preparation and foundation construction on the basis of data provided to us relating to the general location and grade. If changes occur in the design, location, concept, or subsurface conditions of the project, the conclusions and recommendations contained in this report are not valid unless G2 Consulting Group, LLC reviews the changes. G2 Consulting Group, LLC will then confirm the recommendations presented herein or make changes in writing.

The scope of the present investigation was limited to evaluation of subsurface conditions for the support of the proposed building and other related aspects of the development. No chemical, environmental, or hydrogeological testing or analysis were included in the scope of this investigation.

We base the analyses and recommendations submitted in this report upon the data from the soil borings performed at the approximate locations shown on the Soil Boring Location Plan, Plate No. 1. This report does not reflect variations that may occur between the actual boring locations and the actual structure locations. The nature and extent of any such variations may not become clear until the time of construction. If significant variations then become evident, it may be necessary for us to re-evaluate our report recommendations.

Soil conditions at the site could vary from those generalized on the basis of the soil borings made at specific locations. It is, therefore, recommended that G2 Consulting Group, LLC be retained to provide soil engineering services during the site preparation and pavement construction phases of the proposed project. This is to observed compliance with the design concepts, specifications, and recommendations. Also, this is to allow design changes to be made in the event that subsurface conditions differ from those anticipated prior to the start of construction.

APPENDIX

SOIL BORING LOCATION PLAN

PLATE NO. 1

SOIL BORING LOGS

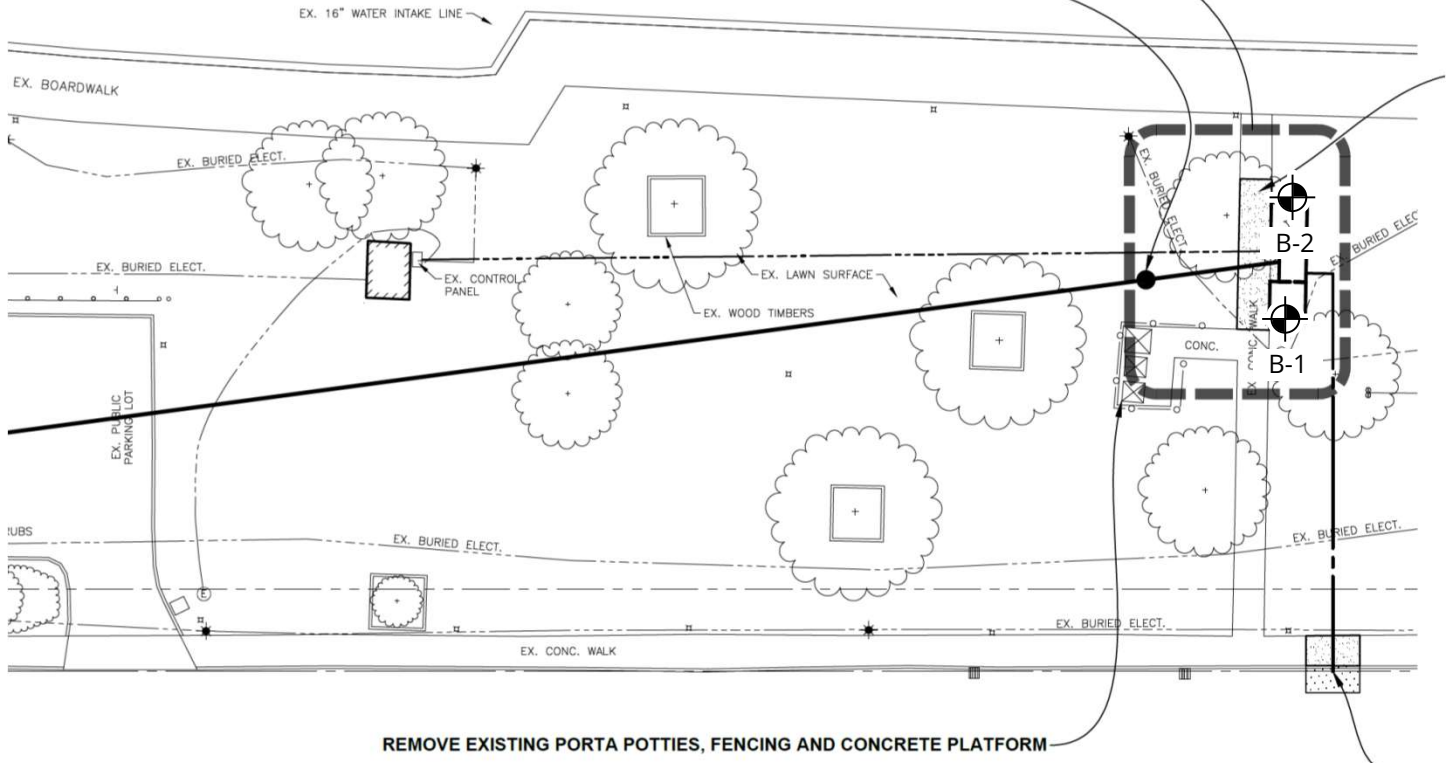
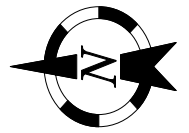
FIGURE NOS. 1 AND 2

GENERAL NOTES TERMINOLOGY

FIGURE NO. 3

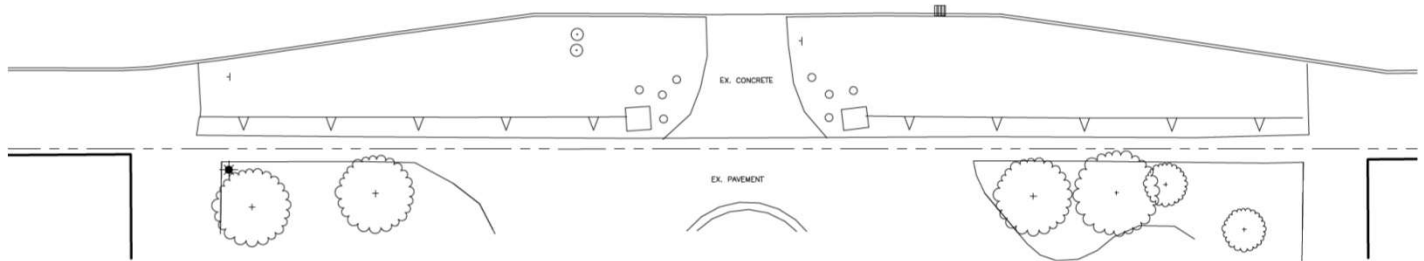
ST. CLAIR RIVER

SANITARY CLEANOUT, 6 INCH (TYP.)



REMOVE EXISTING PORTA POTTIES, FENCING AND CONCRETE PLATFORM

N RIVERSIDE AVENUE (M-29)



Legend

Soil Borings Drilled by Triple R Drilling on March 12, 2026

Soil Boring Location Plan

Palmer Park Restroom Facility
Riverside Avenue
St. Clair, Michigan



Project No. 260214	
Drawn by: MLH	
Date: 3/30/2026	Plate No. 1
Scale: NTS	

Project Name: Palmer Park Restroom Facility

Project Location: Riverside Avenue
St. Clair, Michigan

G2 Project No. 260214



Soil Boring No. B-1
CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
DEPTH (ft)	PRO-FILE	GROUND SURFACE ELEVATION: N/A	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Sandy Clay (12 inches)	1.0						
		Fill: Stiff Dark Brown and Black Silty Clay with trace sand and gravel, fine roots, and asphalt debris (Organic Matter Content = 2.4%)	3.0	S-1	3 5 5	10	19.0		2000*
5		Fill: Very Stiff Brown and Gray Silty Clay with trace sand and gravel, frequent sand layers	5.5	S-2	2 2 2	4	23.5		5000*
		Fill: Very Soft Black, Brown, and Gray Silty Clay with trace sand and gravel, occasional sand partings, wood, brick, and asphalt debris (Organic Matter Content = 3.6%)	8.0	S-3	0 0 1	1	26.2		200**
10		Medium Gray Silty Clay with trace sand and gravel	10.5	S-4	2 1 2	3	21.6		1000*
15		Very Soft Gray Silty Clay with trace sand and gravel	15	S-5	2 1 2	3	27.3		250**
20		End of Boring @ 20 ft	20.0	S-6	0 0 0	0	38.4		200**
25			25						
30			30						
35			35						

Total Depth: 20 ft
 Drilling Date: March 12, 2026
 Inspector:
 Contractor: Triple R. Drilling, LLC
 Driller: R. Rau
 Drilling Method:
 2-1/4 inch inside diameter hollow stem auger

Water Level Observations:
 8 feet during drilling operations; wet cave measured at 9 feet upon removal of augers

Notes:
 * Calibrated Hand Penetrometer ** Torvane

Excavation Backfilling Procedure:
 Auger cuttings

Figure No. 1

Project Name: Palmer Park Restroom Facility

Project Location: Riverside Avenue
St. Clair, Michigan

G2 Project No. 260214



Soil Boring No. B-2
CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
DEPTH (ft)	PRO-FILE	GROUND SURFACE ELEVATION: N/A	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Sandy Clay (14 inches)	1.2						
		Fill: Hard Brown Silty Clay with trace sand and gravel	3.0	S-1	3 4 3	7	16.5		8000*
5		Fill: Medium Brown, Gray, and Black Silty Clay with trace sand and gravel, brick debris, and roots, occasional sand seams (Organic Matter Content = 2.5%)	5.5	S-2	2 1 1	2	25.9		1000*
		Fill: Loose Dark Brown Silty Sand with trace gravel, brick debris, and roots (Organic Matter Content = 4.4%)	8.5	S-3	2 4 3	7			
10		Very Loose Gray Silty Sand with trace gravel	10.0	S-4	1 2 1	3			
15		Very Soft Gray Silty Clay with trace sand and gravel	15	S-5	0 0 0	0	37.4		200**
20			20.0	S-6	0 0 0	0	28.3		100**
		End of Boring @ 20 ft							
25			25						
30			30						
35			35						

Total Depth: 20 ft
 Drilling Date: March 12, 2026
 Inspector:
 Contractor: Triple R. Drilling, LLC
 Driller: R. Rau
 Drilling Method:
 2-1/4 inch inside diameter hollow stem auger

Water Level Observations:
 5-1/2 feet during drilling operations; wet cave measured at 7 feet upon removal of augers

Notes:
 * Calibrated Hand Penetrometer ** Torvane

Excavation Backfilling Procedure:
 Auger cuttings

Figure No. 2

GENERAL NOTES TERMINOLOGY

Unless otherwise noted, all terms herein refer to the Standard Definitions presented in ASTM D 653.

PARTICLE SIZE

Boulders	- greater than 12 inches
Cobbles	- 3 inches to 12 inches
Gravel - Coarse	- 3/4 inches to 3 inches
- Fine	- No. 4 to 3/4 inches
Sand - Coarse	- No. 10 to No. 4
- Medium	- No. 40 to No. 10
- Fine	- No. 200 to No. 40
Silt	- 0.005mm to 0.074mm
Clay	- Less than 0.005mm

CLASSIFICATION

The major soil constituent is the principal noun, i.e. clay, silt, sand, gravel. The second major soil constituent and other minor constituents are reported as follows:

Second Major Constituent (percent by weight)	Minor Constituent (percent by weight)
Trace - 1 to 12%	Trace - 1 to 12%
Adjective - 12 to 35%	Little - 12 to 23%
And - over 35%	Some - 23 to 33%

COHESIVE SOILS

If clay content is sufficient so that clay dominates soil properties, clay becomes the principal noun with the other major soil constituent as modifier, i.e. sandy clay. Other minor soil constituents may be included in accordance with the classification breakdown for cohesionless soils, i.e. silty clay, trace sand, little gravel.

Consistency	Unconfined Compressive Strength (psf)	Approximate Range of (N)
Very Soft	Below 500	0 - 2
Soft	500 - 1,000	3 - 4
Medium	1,000 - 2,000	5 - 8
Stiff	2,000 - 4,000	9 - 15
Very Stiff	4,000 - 8,000	16 - 30
Hard	8,000 - 16,000	31 - 50
Very Hard	Over 16,000	Over 50

Consistency of cohesive soils is based upon an evaluation of the observed resistance to deformation under load and not upon the Standard Penetration Resistance (N).

COHESIONLESS SOILS

Density Classification	Relative Density %	Approximate Range of (N)
Very Loose	0 - 15	0 - 4
Loose	16 - 35	5 - 10
Medium Compact	36 - 65	11 - 30
Compact	66 - 85	31 - 50
Very Compact	86 - 100	Over 50

Relative Density of cohesionless soils is based upon the evaluation of the Standard Penetration Resistance (N), modified as required for depth effects, sampling effects, etc.

SAMPLE DESIGNATIONS

AS - Auger Sample - Cuttings directly from auger flight	ST - Shelby Tube sample - 3 inch diameter unless otherwise noted
BS - Bottle or Bag Samples	
S - Split Spoon Sample - ASTM D 1586	PS - Piston Sample - 3 inch diameter unless otherwise noted
LS - Liner Sample with liner insert 3 inches in length	RC - Rock Core - NX core unless otherwise noted

STANDARD PENETRATION TEST (ASTM D 1586) - A 2.0 inch outside-diameter, 1-3/8 inch inside-diameter split barrel sampler is driven into undisturbed soil by means of a 140-pound weight falling freely through a vertical distance of 30 inches. The sampler is normally driven three successive 6-inch increments. The total number of blows required for the final 12 inches of penetration is the Standard Penetration Resistance (N).